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**INNOVATIVE COKE OVEN GAS CLEANING SYSTEM  
FOR  
RETROFIT APPLICATIONS  
QUARTERLY TECHNICAL PROGRESS REPORT NO. 2  
FOR THE PERIOD COVERING  
APRIL 1, 1989 TO JUNE 30, 1990**

**PARTICIPANT  
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**and**

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**10 September 1990**

**Prepared for the United States Department of Energy  
Under Cooperative Agreement No. DE-FC22-90PC89658**

**Patents Cleared by Chicago on August 14, 1990.**

## **BACKGROUND**

Refer to the Quarterly Technical Progress Report No. 1, May 24, 1989 to March 31, 1990.

## **TECHNOLOGY DESCRIPTION**

There has been no change since the previous Quarterly Report No. 1.

## **PROJECT DESCRIPTION**

There has been no change since the previous Quarterly Report No. 1.

## **PROCESS DESCRIPTION**

There has been no change since the previous Quarterly report No. 1.

## **SUMMARY**

All of the project work since the previous report has been on Phase IIB tasks. Therefore, this quarterly progress report summarizes the period's activities in Engineering, Procurement and Civil Construction. (See Figures 1, 2 and 3, Phase I, IIA and IIB Schedules and Milestone Logs.) Engineering is 95% complete, but revisions and changes are still being incorporated particularly in the Instrument and Electrical areas. (See Figure 4, Engineering Drawing and Design Status.)

Procurement has only valves 4" and above yet to order to complete all major items purchased. (See Figure 5, Procurement Progress Graph.) The scheduled material curve was based on the original estimate of the job. The projected curve reflects the previous month's estimate.

Construction of civil work is proceeding according to schedule in the field. The initial bid packages for the Mechanical General Contractor portion of the work have been reviewed and evaluated. Order placement is scheduled for the end of July. The Electrical package is due back from the bidders on July 6. It requires additional evaluation by BSC and DSO and will not be placed until late August.

The cost of the project is ahead of the cost or spending plan because of the accelerated progress in the field and early delivery of equipment. However, there are some concerns that the mechanical and electrical bid packages are higher than planned. Although we plan to determine the causes of the increases, we do not intend to let it effect the progress of the project.

### Engineering Status

Civil Engineering is 97% complete with some minor revisions being made to accommodate final mechanical data and field conditions. Structural Engineering is 98% complete with minor modifications to accommodate mechanical/piping final checking. Piping is 95% complete except for foam and heat tracing details and late requested changes to sulfur run off piping.

Electric heat tracing has been added to the scope of work replacing steam tracing. Process and instrument drawings (P&ID) showing which lines are to be traced are required.

Electrical interconnection drawings have been started and are 70% complete. Vendor drawing information is required for finalization of electrical interconnection. The cable tray drawing between the main control building, the oil storage, the wet surface air coolers and gas washers is complete. The electrical tray design from the satellite control buildings to the sulfur plant and ammonia distributor are also complete.

The lighting fixtures are located in all the buildings and walkways and the circuiting complete.

Instrument engineering remains 86% complete limited by recent scope changes. All long-term items have been purchased or out for approval by Bethlehem. P&ID drawings were issued for bid packages. Instrument I/O list was revised for data sheet and process changes. Data sheets are 100% complete to original scope. Noncritical loops and location drawings are being updated with current information at about 85% complete. The instrument maintenance loops are 80% complete along with installation detail sheets, about 60% complete. (See Figure 4, Table of Engineering Drawing and Design Status.)

The items remaining to be completed are:

1. Foam piping and firefighting equipment
2. Finalization of winterization of pipework
3. Operating and startup manuals
4. Miscellaneous license applications to various licensing authorities for tanks, scrubbers, etc.

### Procurement Status

Seventy-four purchase orders have been placed and eighty-five inquiries have been issued. The remaining purchasing activities are large bore valves and miscellaneous instruments and the heating ventilation and air conditioning unit for the Main Control Building.

### Construction Status

The civil construction contractor is proceeding ahead of schedule. Equipment is being received at the construction warehouse.

#### Schedule Status

The final overall schedule will be prepared, reviewed and agreed with the successful general contractor. The materials delivery schedule will be adjusted accordingly. The revised completion date for placement of the General Contract is July 30, 1990.

#### Financial Status

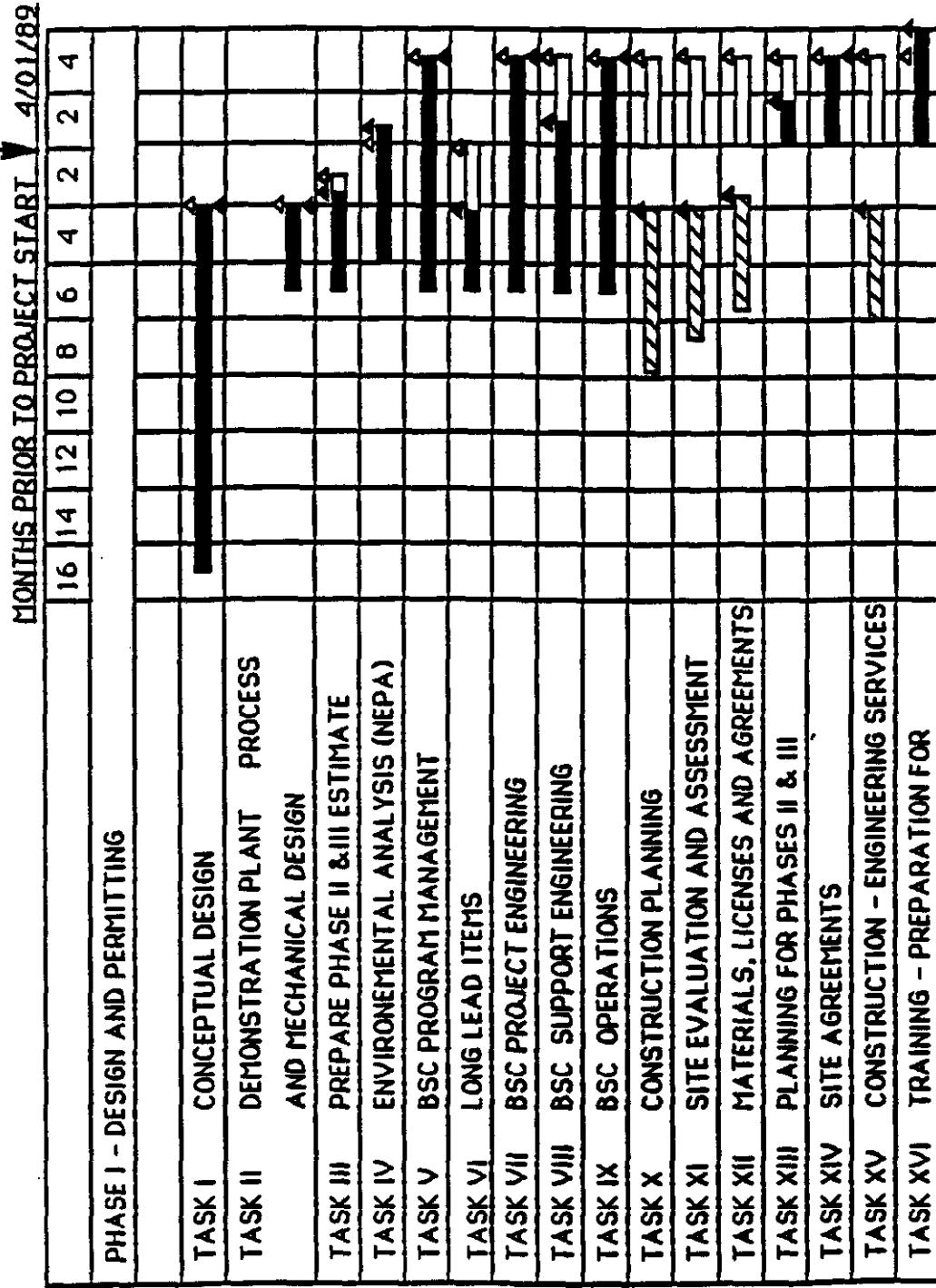
The project's cost data covering Phases I and II and future spending projections is shown in Figures 6 and 7. As discussed previously, actual expenditures through June 1990 are exceeding planned costs. This is by approximately \$1 million. This is a function of an accelerated schedule rather than cost "overruns." However, bid packages for civil, piping and mechanical field works now being reviewed are higher than planned. The results of the reviews and their impact on total project cost is presently under study. (See Figures 6 and 7.)

#### PLANS FOR NEXT QUARTER

The placement of the General Construction and Electrical/Control contracts will be completed. Future project schedules will consequently be finalized. The civil construction progress will continue and erection of certain vessels and structural steel will commence when the General Contractor gets on the site.

The Environmental Monitoring Plan draft will be submitted and the Project Evaluation Plan will be finalized. Work on the preliminary Public Design Report will be initiated

**BETHLEHEM STEEL CORP / DOE**  
**CLEAN COAL PROJECT**  
**SPARROWS POINT, MD.**



▲ - ORIGINAL MILESTONE-COMPLETION

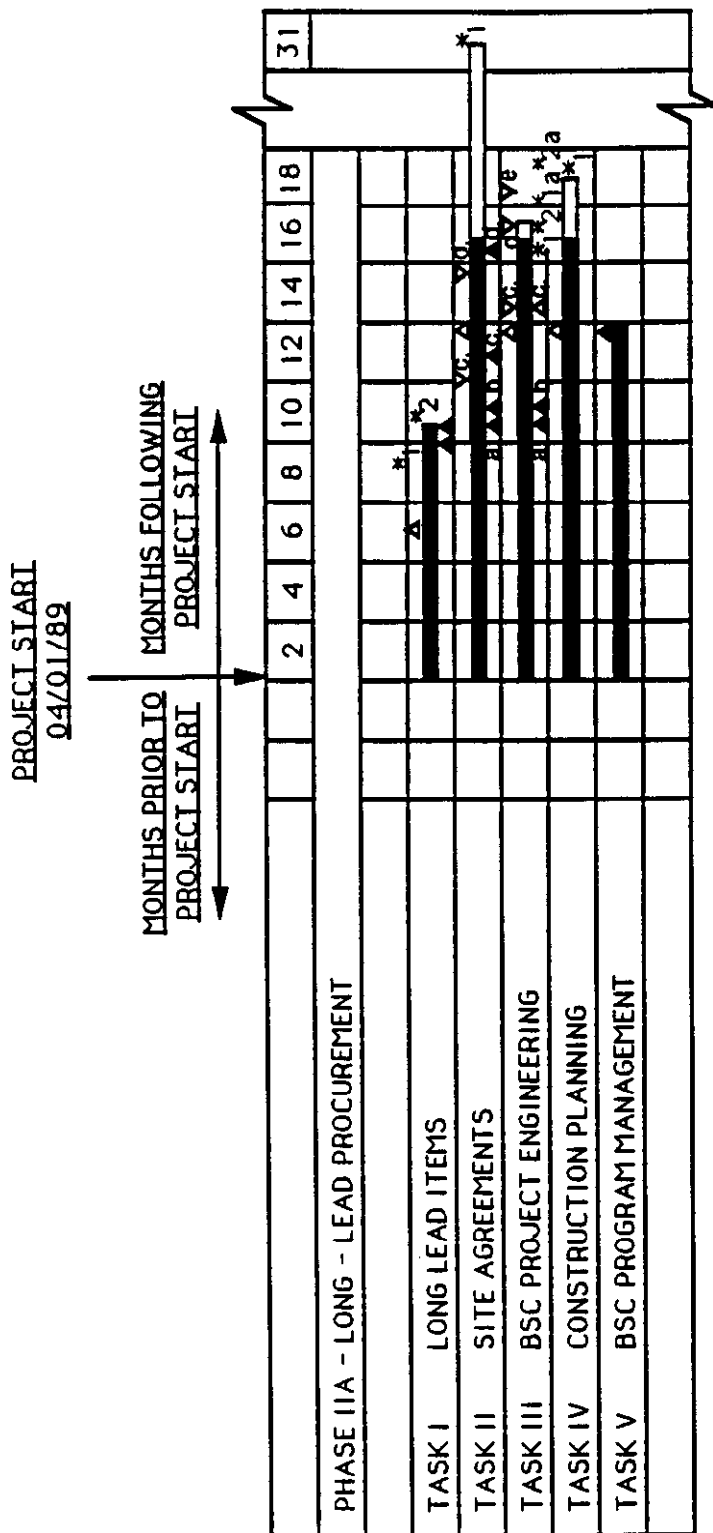
▲ - TASK COMPLETED (MAJOR OR INTERMEDIATE TASK)

\* - REVISED TASK COMPLETION DATE (1ST, 2ND, NTH REVISION)  
1, 2, ... N

## Milestone Log for Phase I Tasks

<u>Task No.</u>	<u>Description</u>	<u>Planned Completion Date</u>	<u>Actual Completion Date</u>	<u>Comments</u>
1	Conceptual Design	1/20/89	1/20/89	Final DSO Report
2	Process & Mechanical Design	1/20/89	1/20/89	Final DSO Report
3	Prepare Phase II & III Est.	3/01/89	2/17/89	FAR Submission
4	NEPA	4/01/89	4/30/89	ERM Report
5	BSC Program Management	6/30/89	6/30/89	-
6	Long Lead Items	4/01/89	1/23/89	1st DSO Schedule
7	BSC Project Engineering	6/30/89	6/30/89	-
8	BSC Support Engineering	6/30/89	4/30/89	Environmental Support
9	BSC Operations	6/30/89	6/30/89	-
10	Construction Planning	6/30/89	1/20/89	Final DSO Report
11	Site Evaluation	6/30/89	1/20/89	Final DSO Report
12	Materials, Licenses	6/30/89	1/20/89	Final DSO Report
13	Planning for II & III	6/30/89	5/31/89	DSO Contract Date
14	Site Agreements	6/30/89	6/30/89	Submit Permit Request
15	Construction - Eng. Serv.	6/30/89	1/20/89	DSO Final Report
16	Training	6/30/89	7/30/89	First Submission by DSO

**BETHLEHEM STEEL CORP./DOE**  
**CLEAN COAL PROJECT**  
**SPARROWS POINT, MD.**  
**PHASE IIA SCHEDULE**



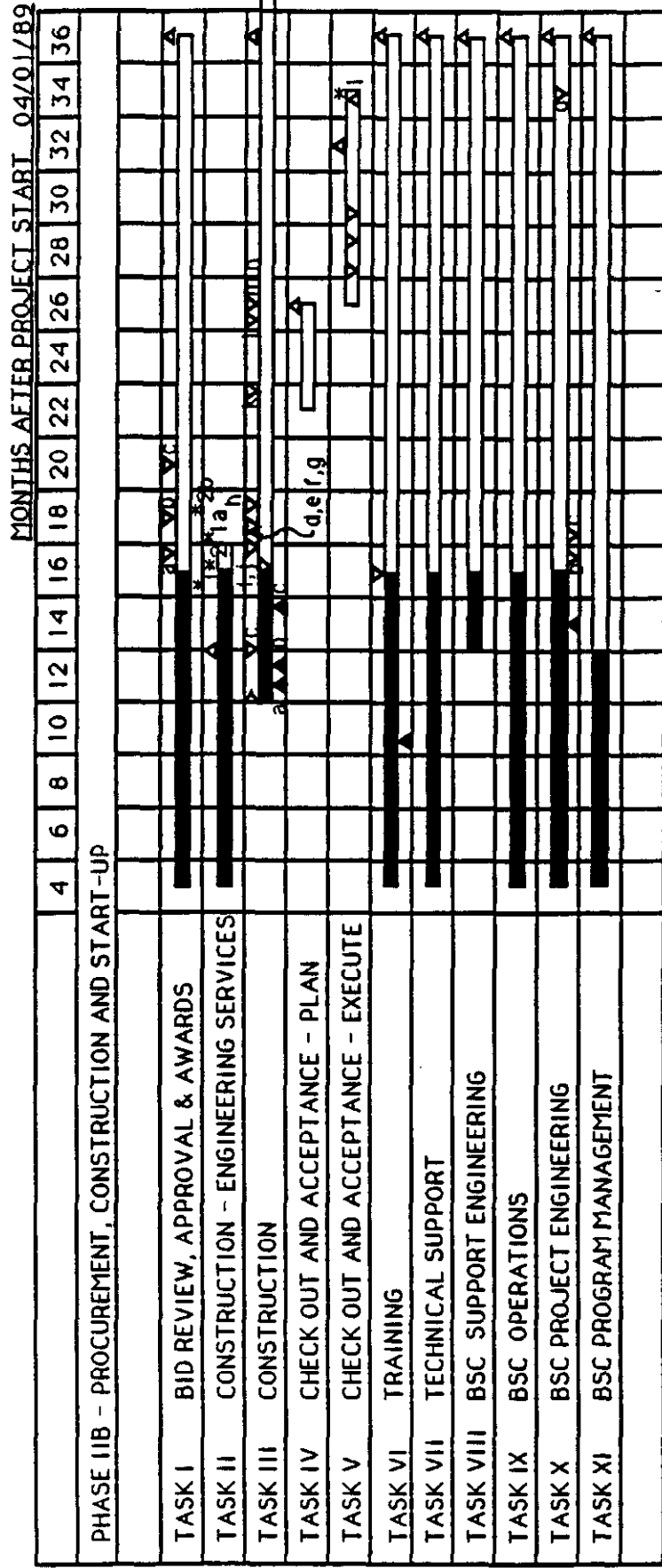
- ▲ = ORIGINAL MILESTONE / COMPLETION DATE
- ▲ = TASK COMPLETED (MAJOR OR INTERMEDIATE TASKS)
- \* = REVISED TASK COMPLETION DATE (1ST, 2ND, NTH REVISION)  
1, 2, ... N
- ▼ = INTERMEDIATE EVENTS - SEE MILESTONE LOG

MILESTONE LOG FOR PHASE IIA TASKS

FIGURE 2  
2 of 2

WBS NO.	DESCRIPTION	ORIGINAL COMPLETION DATE	INTERMEDIATE EVENTS	REVISED COMPLETION DATE	ACTUAL COMPLETION DATE	COMMENTS
	Long Lead Items	08/31/89		11/30/89	11/30/89	All 6 month delivery orders except electrical substation, items placed.
*1						
*2				12/15/89	12/08/89	Electrical substation order placed.
	Site Agreements	03/31/90		10/10/91		End date changed to reflect anticipated date of system acceptance.
*1			a. 12/15/89 b. 01/12/90 c. 02/28/90 d. 05/04/90	04/06/90	12/13/89 01/19/90 04/04/90 06/01/90	Date of Inquiry - piling contract Date of Inquiry - foundation contract Date of Inquiry - general construction contract Date of Inquiry - electrical/control contract
	BSC Project Engineering	03/31/90		06/15/90 07/30/90		End date changed to reflect placing of general construction contract.
*1						
*1a						
*2				07/16/90 08/15/90		End date changed to reflect placing of construction contract including electrics.
*2a			a. 12/15/89 b. 01/15/90 c. 03/16/90 d. 06/01/90 e. 07/16/90	04/20/90 07/30/90 08/15/90	12/08/89 01/19/90 05/02/90	Complete long lead item review. Place Contract - piling contractor Place Contract - foundation contractor Place Contract - general construction Place Contract - electrical/control
	Construction Planning	03/31/90				
*1				08/31/90		End date changed to reflect all major equipment on site.
			06/10/90	07/30/90		General construction contractor on site
	Program Management	03/31/90				Will continue to meet reporting deadlines.

**BETHLEHEM STEEL CORP / DOE  
CLEAN COAL PROJECT  
SPARROWS POINT, MD.  
PHASE IIB SCHEDULE**



- ▲ = ORIGINAL MILESTONE / COMPLETION DATE
- ▲ = TASK COMPLETED
- \* = REVISED TASK COMPLETION DATE (1ST, 2ND, NTH REVISION)  
1, 2, ... N
- ▼ = INTERMEDIATE EVENT - SEE MILESTONE LOG
- ▶ = REVISED MILESTONE DATE - BEGIN TASK

MILESTONE LOG FOR PHASE IIB TASKS

ASK NO.	DESCRIPTION	ORIGINAL COMPLETION DATE	INTERMEDIATE EVENTS	REVISED COMPLETION DATE	ACTUAL COMPLETION DATE	COMMENTS
	Bid Review, Approval and Awards	02/28/92	a. 06/01/90 b. 08/31/90 c. 10/31/90	07/30/91		Place general construction contract All major equipment on site. Final invoicing for equipment (except for retention)
	Construction Engineering	03/31/90		06/15/90 07/30/90		Place construction contract.
	*1 *1a			07/16/90 08/15/90		Place Electrical/Control contract.
	*2 *2a					
	Construction	02/28/92	a. 02/01/90 b. 03/30/90 c. 04/02/90 d. 06/01/90 e. 06/10/90 f. 07/02/90 g. 07/16/90 h. 09/01/90 i. 09/04/90 j. 09/04/90 k. 01/21/91 l. 04/05/91 m. 04/24/91 n. 05/01/91	04/30/90 07/30/90 08/01/90 08/15/90 10/30/90 10/01/90 10/01/90	02/12/90 03/19/90 05/21/90	Start pile driving. Complete pile driving. Begin foundation construction. Place general construction contract. General contractor on site. Begin erection of vessels and structural steel. Place electrical/control contract. End foundation construction. Begin piping installation. Begin electrical installation. End erection of vessels and structural steel. End piping installation. End electrical installation. End general construction.
	Check out and Acceptance Plan	05/01/91		05/31/91		

age 2 MILESTONE LOG FOR PHASE IIB TASKS

FIGURE 3  
3 of 3

ASK NO.	DESCRIPTION	ORIGINAL COMPLETION DATE	INTERMEDIATE EVENTS	REVISED COMPLETION DATE	ACTUAL COMPLETION DATE	COMMENTS
	Check out and Acceptance - Execute	10/31/91				
*1			a. 05/01/91 b. 07/01/91 c. 07/02/91 d. 08/02/91 e. 08/02/91 f. 12/10/91	12/31/91 05/31/91 07/31/91 07/31/91 08/30/91 08/30/91 12/31/91		Meet compliance. Begin cold commission. End cold commission. Begin hot commission. End hot commission. Begin punch list. End punch list.
	Training	02/28/92	11/30/89 06/01/90		11/30/89	Draft of training manuals. Complete training manuals.
	Technical Support	02/18/92				Ongoing as required.
	BSC Support Engineering	02/28/92				Ongoing as required.
	BSC Operations	02/28/92	xxx xxx			Begin training. End training.
0.	BSC Project Engineering	02/28/92	a. 04/12/89 b. 05/31/90 c. 06/01/90 d. 12/31/91	07/16/90 08/16/90	04/12/89	Begin monthly engineering team meetings. End monthly engineering team meetings. Begin monthly construction team meetings. End monthly construction team meetings.
1.	BSC Program Management	02/28/92				Will continue to meet reporting deadlines.

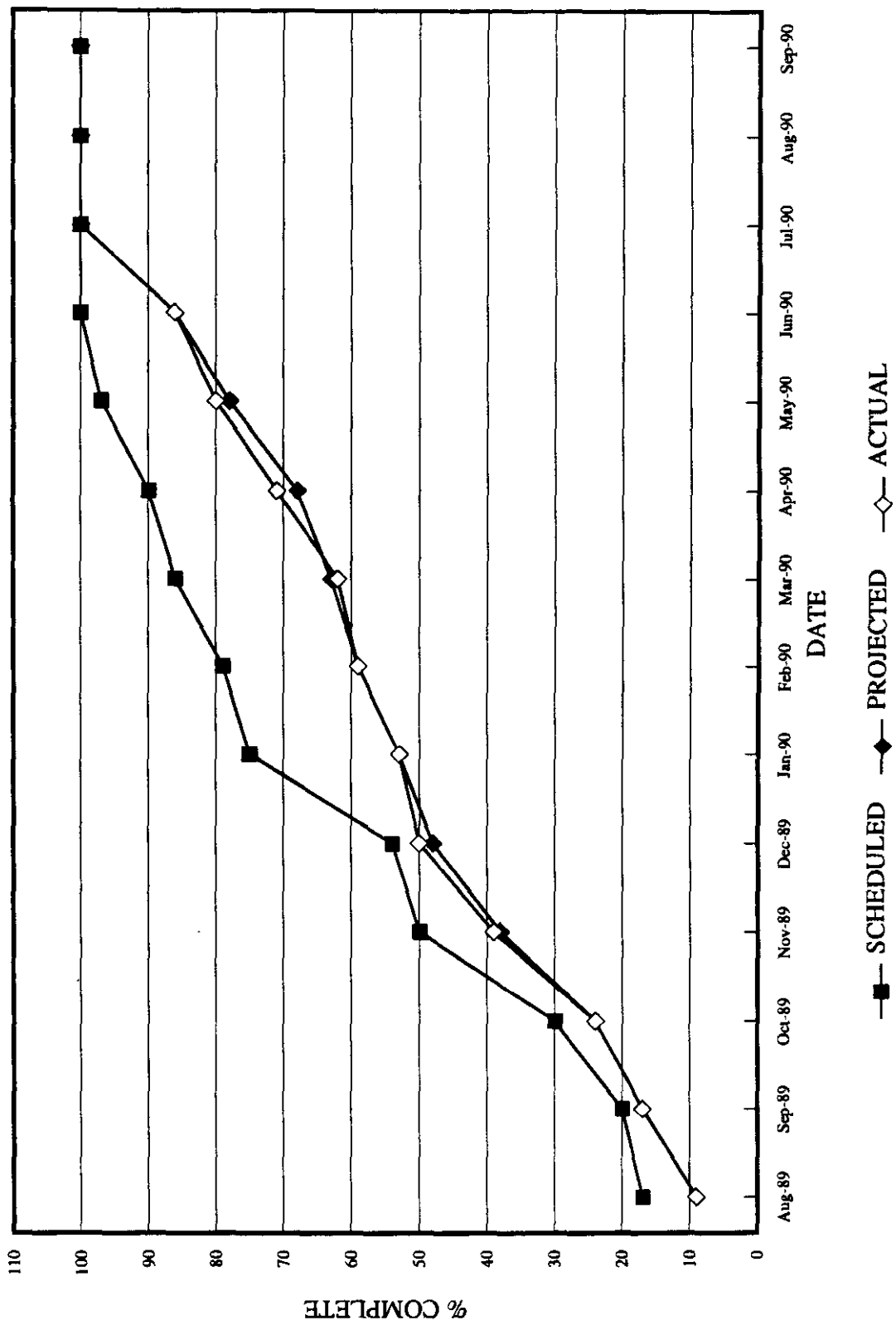
**FIGURE 4**

**BETHLEHEM STEEL CORPORATION  
SPARROWS POINT  
COAL CHEMICAL PROJECT**

**ENGINEERING DRAWINGS AND DESIGN STATUS**

DISCIPLINE	ESTIMATED # OF DRAWINGS		# OF DRAWINGS COMPLETED		PERCENT COMPLETE		ENGINEERING MILESTONES- 95% COMPL.
	PREVIOUS	CURRENT	PREVIOUS	CURRENT	PREVIOUS	CURRENT	
1. MECHANICAL & VESSELS	122	122	121	121	99.0%	99.0%	30-SEP-89
2. PIPING	187	187	184	184	95.0%	95.0%	30-MAR-90
3. CIVIL	69	69	68	68	97.0%	97.0%	16-MAR-90
4. STRUCTURAL	58	58	58	58	98.0%	98.0%	30-MAR-90
5. ELECTRICAL	115	115	83	88	88.0%	90.0%	15-AUG-90
6. INSTRUMENTATION	260	260	215	225	84.0%	84.0%	15-AUG-90
TOTAL:	811	811	729	744	91.5%	91.8%	

FIGURE 5 - BETHLEHEM STEEL CORP - COAL CHEMICAL PROJECT  
PROCUREMENT PROGRESS



**FIGURE 6 - TOTAL PROJECT COST VS. DOE COST SHARE THROUGH 3RD Q 1990**  
**COKE OVEN GAS CLEANING SYST.FOR RETROFIT APPLIC.**  
**A&B COAL CHEM. PLANTS, SPARROWS POINT, MD.**

